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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/091,430	03/07/2002	Shmuel Cabilly	P-3694-US	9454

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EXAMINER	
BARTON, JEFFREY THOMAS	

ART UNIT	PAPER NUMBER
1753	

DATE MAILED: 09/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/091,430	CABILLY ET AL.	
	Examiner	Art Unit	
	Jeffrey T. Barton	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 June 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *73-76,78-82 and 93-96* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *73-76,78-82 and 93-96* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment filed on 21 June 2006 doe snot place the application in condition for allowance.

Status of Rejections Pending Since the Office Action of 21 December 2005

2. The rejection of claims 73-76, 78-80, 82, and 93 under 35 U.S.C. §102(b) as anticipated by Cabilly et al is withdrawn due to Applicant's amendment.

3. The rejection of claim 81 under 35 U.S.C §103(a) as unpatentable over Cabilly et al is maintained.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 73-76, 78-82, and 93-95 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cabilly et al. (WO 97/41070)

Regarding claim 73, Cabilly et al disclose an electrophoresis apparatus and methods for its use, comprising: a body of separating gel (Figure 21, gel 518); a cathode electrically coupled to a first end of the gel (Figure 21, cathode 326); an anode comprising an electrochemically ionizable metal (Figure 21, anode 324; Page 23, lines 12-17), said anode being disposed in a semi-solid ion reservoir containing a buffer (Figure 21 - anode 324 is partially covered by matrix 320; Page 25, lines 1-13 - a gel immersed in buffer solution can be characterized as "semi-solid"), said semi-solid ion reservoir being disposed at a second end of the gel body (Figure 21) and electrically coupled to the gel body, said ion reservoir and buffer being configured for retarding the

migration of ions of the electrochemically ionizable metal in the gel body during electrophoresis. (Page 8, lines 19-21; Page 12, lines 22-36; Page 23, lines 12-17) They also disclose the use of a buffer comprising tris and glycine, which are an amine and a Zwitterion, respectively. (Page 24, lines 22-27 and Page 25, lines 1-13)

Regarding claim 74, Cabilly et al disclose the electrodes, gel body, and ion reservoirs being disposed in a substantially closed cassette. (Figures 3, 4, 19-21)

Regarding claims 75 and 76, Cabilly et al disclose an aluminum cathode and copper electrodes. (Page 8, lines 17-18 and 27-29)

Regarding claims 78 and 79, the pKas of tris and glycine differ by about 1.5.

Regarding claim 80, Cabilly et al disclose polyacrylamide and agarose gel bodies. (Page 11, lines 22-24)

Regarding claim 82, Cabilly et al disclose the gel body comprising sample wells. (Page 13, lines 4-6)

Regarding claim 93, glycine comprises a carboxyl group.

Regarding claim 94, Cabilly et al discloses a tris/glycine buffer of ~217 mM concentration. (Page 25, lines 8-10)

Regarding claim 95, Cabilly et al disclose the gel comprising a buffer having an amine and Zwitterion. (Page 24, lines 20-30)

Cabilly et al do not explicitly disclose that the ~217 mM tris/glycine buffer is used in the final preparation of cation exchange matrix 320 - they simply disclose that the "Sephadex particles were suspended in 1 ml of 3% agarose in tris-glycine buffer to form

the cation exchange matrix 320 of cassette 300." in step D of Example 7. (Page 25, lines 1-13) They do not specifically disclose the claimed range of conductivity. Specific to claim 81, Cabilly et al do not explicitly disclose the ion migration not exceeding the limits of the ion reservoir.

However, Cabilly et al only disclose two tris-glycine buffer concentrations - the ~217 mM solution used earlier in Example 7, and a ~2.17 M solution used earlier in example 6. Both solutions would clearly have been recognized as suitable for use in an electrophoresis device, and use of either would have been obvious to a skilled artisan, depending on the buffer capacity required, desired voltage to be applied, etc. Applicant points out in the Remarks of 21 June 2006 that the 2.17 M tris-glycine solution would have conductivity over 5 times that required in the claim. The use of a buffer that is diluted by a factor of 10 would therefore fall within the claimed conductivity range, given the dependence of conductivity on ion concentration.

Specific to claim 81, it would also have been obvious to one having ordinary skill in the art at the time the invention was made to select a sample, buffer system, concentrations, voltages, etc. such that the capacity of the ion reservoir was sufficient for the required analyte migration. This would be necessary for successful system operation.

Furthermore, note MPEP §2144.05, which states in part that "[g]enerally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such

concentration or temperature is critical." "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Such changes in concentration are inextricably linked to the buffer conductivity.

8. Claim 96 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cabilly et al in view of Slater et al, van Holst et al, and the "Pro-Pure Proteomics Grade" brochure.

The disclosure of Cabilly et al disclose an electrophoresis apparatus as described above in addressing claims 73-76, 78-82, and 93-95.

Cabilly et al do not explicitly disclose a buffer in the separating gel having the claimed conductivity.

Slater et al teach that a low conductivity buffer reduces the amount of undesirable Joule heating in gel electrophoresis. (Column 7, lines 33-43)

van Holst et al teach protein electrophoresis using 1x tris-glycine buffer having a concentration of 225 mM concentration. (Page 787, 2nd column, 1st full paragraph)

The "Pro-Pure Proteomics Grade" brochure advertises a 1X tris-glycine buffer for electrophoresis with 217 mM concentration, stating that "TG-SDS buffer is a widely used running buffer for denaturing electrophoresis of proteins". (5th page, Tris-Glycine (TG) Tris-Glycine -SDS section)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Cabilly et al by using a lower

conductivity buffer, as taught by Slater et al, because it would have reduced Joule-heating, which a skilled artisan would have recognized as an advantage, since it would allow higher applied voltages and reduced distortion to the migration due to temperature variation. van Holst et al and the "Pro-Pure Proteomics Grade" brochure teach that a 1x buffer that has one tenth the concentration of the gel buffer disclosed by Cabilly et al is known to be suitable for gel electrophoresis separations. Applicant points out in the Remarks of 21 June 2006 that a 2.17 M tris-glycine solution would have conductivity over 5 times that required in the claim. The use of a buffer that is diluted by a factor of 10 would therefore fall within the claimed conductivity range, given the dependence of conductivity on ion concentration.

Furthermore, note MPEP §2144.05, which states in part that "[g]enerally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical." "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Such changes in concentration are inextricably linked to the buffer conductivity.

Response to Arguments

9. Applicant's arguments filed 21 June 2006 have been fully considered but they are not persuasive.

Applicant argues that Cabilly et al do not disclose the claimed buffer conductivity range, with reference to one of two disclosed tris-glycine buffers that are used by Cabilly with total concentration over 2 M. However, Cabilly et al also disclose a buffer that has one tenth the concentration of this buffer and meets the concentration and conductivity requirements of the claims. Cabilly et al are silent as to which buffer is used to form the Cation exchange matrix in Example 7. The Examiner maintains that use of either would clearly have been obvious to a skilled artisan.

Furthermore, as stated above, "[g]enerally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical." "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). The buffer conductivity is known by anyone having skill in this art to vary with such concentration variations, and there is no evidence whatsoever that the claimed range is critical to the invention.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Jeffrey T. Barton whose telephone number is (571) 272-1307. The examiner can normally be reached on M-F 9:00AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JTB
31 August 2006

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SUPERVISORY PATENT EXAMINER
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